

BIBLIOGRAPHICAL NOTICES.

Beiträge zur Naturgeschichte der Turbellarien. Von Dr. MAX. SIGISMUND SCHULZE: Greifswald, 1851.

Contributions to the Natural History of the Turbellaria. By Dr. MAX. S. SCHULZE.

THIS is an especially *German* book. To a considerable, and happily an increasing, number of English naturalists the meaning of this epithet is plain enough, but we fear that there is a still larger number to whom it will be very doubtful whether thereby we confer praise or blame.

To these the term "German" has a dire and mystical import, compounded of "Rumpel-Stiltskin," the writings of Mr. Carlyle, and Oken's 'Physiophilosophy,' the chief sources whence their knowledge of the literature and science of our Saxon fatherland is derived; the resulting impression being, for the most part, that the secret of German authorship consists in writing what is unintelligible in the greatest possible number of capital letters.

Doubtless there is something of truth in this popular impression, as in all popular impressions; but it may be worth while to look further into the matter.

The cloud of dust in the desert *may* be kicked up by a mere troop of wild asses; but the wise traveller will remember that it may also hide the strength of an army.

Dust enough about the tents of our German sheiks there indubitably is, and good Mr. Bull, averse in his very nature to everything that is not neat, trim, close-shaven and well-brushed, will see nothing else, and passes by on the other side with coughs, curses, and a copious pouring forth of such adjectives as cloudy, mystical, metaphysical, and, if the worst come to the worst, perhaps pantheistical.

Yet, as we said before, it may be well not to sit down finally in this belief.

In the domain of literature and critical learning it is coming to be a very current opinion, that whatever be the practical results, in purpose and aim Germany is ahead of us. There is a laborious attention to details combined with a philosophic breadth of view and freedom of speculation;—there is an earnest piety in the search after truth, joined to the widest toleration for results, which, though not unknown, is far too little known on this side of the water.

It would be impossible for one branch of human activity to stand alone in these respects, and German science has not escaped the noble contagion of the example of German literature. It may be fearlessly asserted, that in no country does science as a whole stand on so high a footing as in Germany.

In no other country do the savans so clearly comprehend the great truth, that the man of science is also an artist—that he should strive to give a roundness, a symmetry, and a completeness to all his works, however small and seemingly insignificant, and that in proportion as

he does so is he nearing the true goal, and freeing himself from the suspicion of wasting his time on elaborate trifles.

“Eh man! for Guid’s sake leave off skinning slugs and be a man!” quoth a Professor of Greek to a Professor of Natural History; and though happily the reproach was much misplaced where it was applied, it might we fear be addressed with great justice to many of those who follow natural science in England.

We gloat over new species and gather together as many slides with “objects” on them as would roof in the Crystal Palace; we tax our mechanists and opticians to make us instruments whereby we may view these things; and all the while, the living, moving, feeling works of God, of which these are but shreds and fragments, are neglected, and the grand laws which rule their being, undiscovered. As if a foreigner wishing to become acquainted with the English in the 19th century were to go to Monmouth Street and study the old clothes, shutting his eyes to the men and women who elbow him.

It is as the antithesis of all this that we called Dr. Schulze’s a peculiarly German book. The animals which he has investigated are nearly allied to the well-known *Planariae*, and are found plentifully enough in both fresh and salt water. Now two methods of proceeding lay open to him:—either, following the approved Anglican mode (having first set up an elegant cabinet full of drawers, filled with neatly-made glass cells), he might have scoured the country, bored his friends, and caught his death of cold in seeking these worms, singing Io Pæan whenever they afforded a sufficient pretence for inventing a new dog-Latin name (which is called discovering “a new species”), and finally have consigned his treasures to the cabinet aforesaid to be eventually “figured and described” in some exquisite and useless work;—

Or, as Dr. Schulze *has* fortunately preferred doing, he might have acquired a thorough knowledge of a few species, entering, with an insight which can only result from wide knowledge, into the details of anatomy, histology, development and chemical composition; comparing and, so far as possible, reconciling the discrepant statements of other observers, and therefore possessing a thorough acquaintance with the literature of his subject; in a word, fulfilling the Horatian rule in art, and making his work “totus, teres, atque rotundus.” Such is the German method. If we were to find a fault in this case, it would be with a certain diffuseness and needless repetition.

We subjoin the chief results at which Dr. Schulze has arrived:—

1. The integument of the straight-intestined (*Rhabdocœla*) *Turbellaria* consists of a soft homogeneous finely granular base, which bears the cilia and contains many clear spaces in its interior. In this it resembles the substance of the body of the Infusoria and Hydræ (sarcode of Dujardin, formless contractile substance of Ecker); it is distinguished from it however by the fact, that on treating it with certain reagents, especially diluted ammonia, it becomes broken up into regular pieces, each of which consists of an aggregation of vacuolæ (Hohlräumen) and the appertaining connecting substance. This breaking up can only be explained on the supposition, that each re-

gular piece was originally a cell ; the wall and contents of the original cells are metamorphosed into the sarcode-like substance, whose origin out of cells has not yet been demonstrated ; the cells themselves however are not so fused together as to be inseparable by reagents.

2. The columnar bodies of the *Rhabdocœla* and freshwater *Dendrocœla* consist of a peculiar substance distinguished by its difficult solubility in alkalies and its ready disintegration by water and dilute acids. They differ widely from the urticating organs or "Thread-cells" of the *Acalephæ* and *Polypes*. In many kinds they have a peculiar relation to the nervous system, and may be probably regarded as subserving the development of the sense of touch.

3. The green colouring matter of *Vortex viridis* and *Mesostomum viridatum* is identical with the chlorophyll of plants ; so is that of *Hydra viridis* and *Stentor polymorphus*.

4. The nervous system is developed in all families of *Rhabdocœla*, and consists of two ganglia united by a commissure, or of a double ganglion with the threads proceeding from it.

5. The organs of sense occur as eyes with or without lenses, and as auditory organs.

6. The hard parts of the male organ consist of a substance similar to chitin, distinguished from it however by its solubility in boiling solution of caustic potass.

7. The hard shell of the ova of *Rhabdocœla* and *Dendrocœla*, of *Clepsine*, *Nephelis*, and *Hydra viridis*, consists of chitin.

The polypidom of *Sertularidæ* and *Campanularidæ* consists of chitin.

8. In a new species of the *Nemertidæ*, *Tetrastemma obscurum*, living young were observed in the body of the parent, while hitherto the *Nemertidæ* were only known to be oviparous. The development of the young takes place without metamorphosis.

9. The development of the stylet of *Tetrastemma* goes on thus—the handle arises separately as the nucleus of a cell ; the style, on the other hand, is taken from the preformed lateral style-sacs (*Spitzen-taschen*) ; hence it may be concluded that the styles of the lateral sacs are afterwards to be regarded as really styles in reserve.

10. In the same *Nemertid*, as well as in *Prorhynchus stagnalis*, a new freshwater species, there exists a water vascular system whose existence in the *Nemertidæ* was not yet known.

We had intended to comment at some length upon some of these statements, but our space will allow of only a hasty reference to a few of the more important :—

1. The conclusion that the tissues of the *Turbellaria* are the result of cell-development ; that therefore the law of Schwann prevails here no less than in the rest of the animal kingdom ; and that thence the sarcode of Dujardin (the formless contractile substance of Ecker) has no right to be considered as a special histological element, will, we believe, be fully borne out in other cases. The substance of the *Polypes* (including *Hydra*), of the *Medusæ*, of the *Sponges*, may always, with proper precautions, be shown to be composed of true nucleated cells. These cells frequently manifest "protean" contractile

properties, but so does the white corpuscle of the human blood which is an indubitable cell.

2. It is interesting to observe that the similarity of the "columnar bodies" of the *Rhabdocœla* to the "thread-cells" of the Medusæ, Polypes, &c. is only superficial, and that therefore the value of the existence of the latter bodies, as a character, is not weakened.

We believe it to be very probable that further investigation will show that the existence of "thread-cells" in *Eolis* is only accidental, and that the genuine "thread-cell" is as characteristic of the Polypes and *Acalephæ* as the mammæ of the Mammifera.

3. In all probability, to this list of animals containing chlorophyll should be added *Spongilla fluviatilis*. Its occurrence in so highly organized animals as the Turbellaria is however very interesting, and removes one more of the supposed distinctions between plants and animals.

5. To this catalogue of organs of sense, we believe that the ciliated pits of the Nemertidæ might be added as either gustatory or olfactory organs; such ciliated pits in connection with the nervous centres, and very probably subserving one or other of these functions, are found in *Amphioxus*, the Tunicata, and the Rotifera.

7. The existence of chitin in the Turbellaria, in *Clepsine*, *Nephelis* (which confirms Grube's statement that it is found in the Annelida), and the Hydroid Polypes (to which, according to Grube, we must add the Nematoid worms), is a fact of great value, as its presence has been regarded as characteristic of the Arthropoda.

Finally, the demonstration with which Dr. Schulze furnishes us of the true structure of the Nemertidæ, gives a new proof, if any were wanted, of the extreme value of the microscope, as a means of checking the results of dissection among the Invertebrata. More would be done for the true knowledge of the structure of the Nematoid worms by the lucky discovery and careful examination of some very transparent species, than all the labours of the knife and forceps have hitherto effected.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

July 9, 1850.—John Gould, Esq., F.R.S., in the Chair.

DESCRIPTION OF FIVE NEW SPECIES OF ANODONTÆ, COLLECTED BY H. CUMING, ESQ. IN THE EAST INDIES. BY ISAAC LEA.

ANODONTA GRACILIS. *A. testâ latâ, subcylindraceâ, inæquilaterali; valvulis tenuibus; natibus subprominentibus; epidermide luteâ; margaritâ vel albâ vel purpureâ.*

Hab. Dingle, Isle of Panay.

Diam. 1; length 1·7; breadth 3·4 inches.

Remarks.—This species is more cylindrical than is usual with the *Anodontæ*, and differs from the other species taken by Mr. Cuming.